

CLAIMS

1. A power control system for an electric traction motor in a vehicle comprising:

at least one inverter for providing conditioned electrical power to the electric traction motor;

5 a plurality of power stages for providing DC power to said at least one inverter, each stage including a battery and boost/buck DC-DC converter, said power stages wired in parallel; and

wherein the power stages are controlled to maintain an output voltage to said at least one inverter.

2. The power control system of Claim 1 wherein each stage is individually current controlled to balance the state of charge of each said battery.

3. The power control system of Claim 1 wherein said inverter provides switched three phase power to said electric motor.

4. The power control system of Claim 1 wherein said battery comprises a low voltage battery.

5. The power control system of Claim 4 wherein said battery comprises a battery having a voltage of substantially 12 volts.

6. The power control system of Claim 4 wherein said battery comprises a battery having a voltage of substantially 42 volts.

7. The power control system of Claim 1 further including a current sensor for each power stage to detect the current in the power stage.

8. The power control system of Claim 1 wherein each said power stage includes a boost switch.

9. The power control system of Claim 1 wherein each said power stage includes a buck switch.

10. A vehicle drive system:
a plurality of power stages, each said power stage including a battery, and a boost/buck DC-DC converter;
at least one motor inverter electrically coupled to said plurality of power stages for providing conditioned electrical power;
at least one electrical motor electrically coupled to said at least one motor inverter; and
wherein said plurality of power stages are individually current controlled and wherein said plurality of power stages are jointly controlled to regulate an output voltage.

11. The vehicle drive system of Claim 10 further comprising an internal combustion engine coupled in a parallel hybrid configuration with said electric motor.

12. The vehicle drive system of Claim 10 further comprising an internal combustion engine coupled in a series hybrid configuration with said electric motor.

13. The vehicle drive system of Claim 10 wherein said battery comprises a battery having an operating voltage of substantially 12 volts.

14. The vehicle drive system of Claim 10 wherein said motor is an induction motor.

15. The vehicle drive system of Claim 10 wherein said battery operates at a voltage of substantially 42 volts.

16. The vehicle drive system of Claim 10 wherein said motor inverter provides three phase electrical power to said electric motor.

17. The vehicle drive system of Claim 10 further including a current sensor for each said DC-DC converter.

18. A method of generating voltage for the operation of an electric motor in a vehicle comprising:

providing a plurality of power stages connected in parallel, each power stage including a boost/buck DC-DC converter and low voltage battery;

5 providing at least one motor inverter for generating conditioned electric power to the electric motor to actuate the electric motor;

sensing the current provided by each power stage;

controlling the current individually in each power stage; and

10 controlling the overall output voltage of the plurality of power stages wired in parallel.

19. The method of Claim 1 further comprising the step of controlling regeneration current into each power stage to obtain a balanced charge in each low voltage battery.

20. The method of Claim 1 further comprising the step of controlling the current from each power stage to obtain a balanced discharge in each low voltage battery.